Adopted as a Federal Information Processing Standard

FIPS 2

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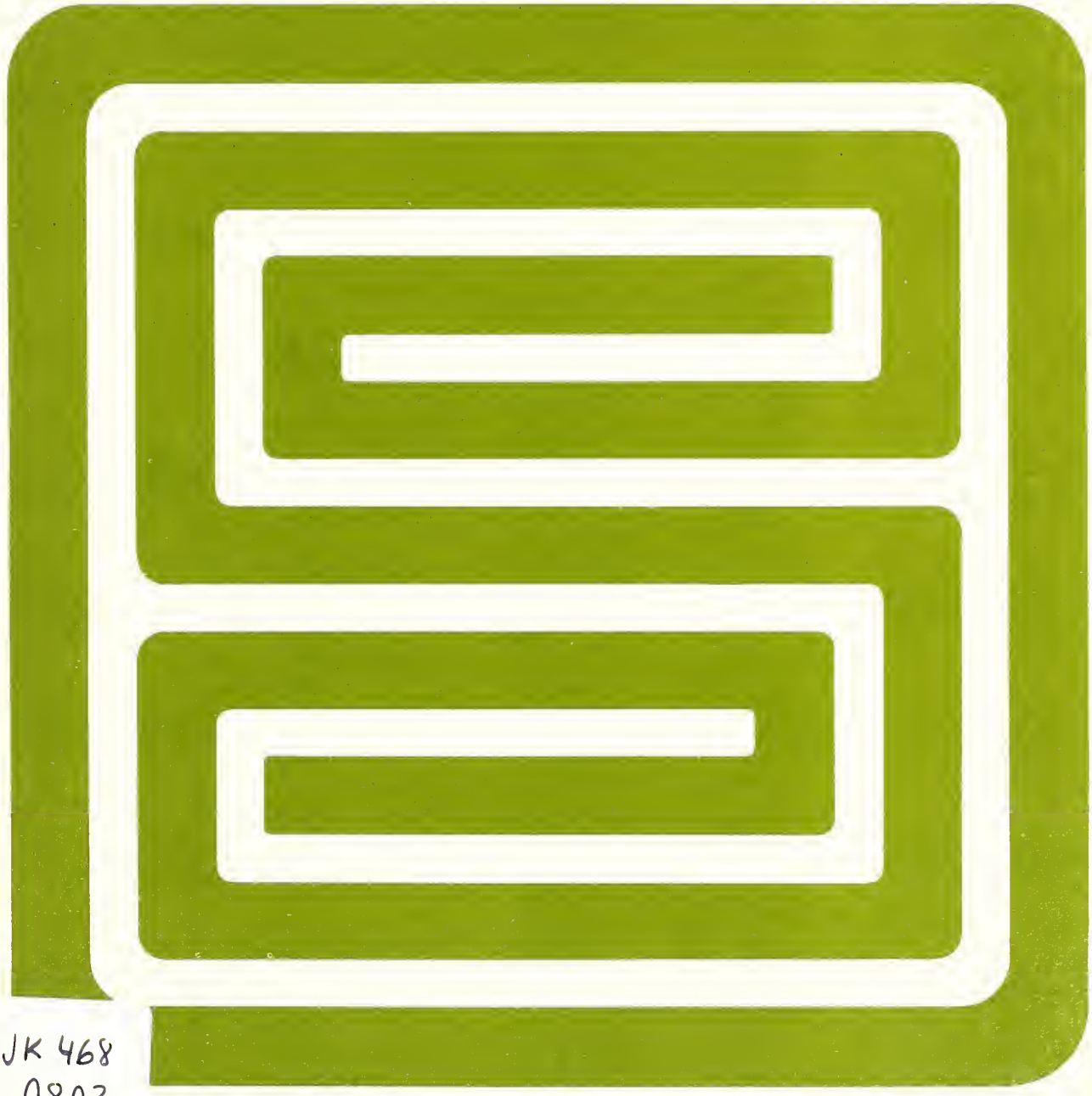
USAS
X3.6-1965

USA Standard

Perforated Tape Code for Information Interchange



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1965

This USA Standard was approved as a Federal Information Processing Standard by the President of the United States, Lyndon B. Johnson, on March 11, 1968.

Details concerning its applicability and use are printed in a National Bureau of Standards series of publications called *Federal Information Processing Standards Publications*. For a complete list of the publications in this series write to the Office of Technical Information and Publications, National Bureau of Standards, Washington, D.C. 20234

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USAS
X3.6-1965

USA Standard Perforated Tape Code for Information Interchange

Sponsor

Business Equipment Manufacturers Association

Approved July 9, 1965

USA Standard

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Foreword

(This Foreword is not a part of the USA Standard Perforated Tape Code for Information Interchange, X3.6-1965.)

This publication represents the standard method of recording the USA Standard Code for Information Interchange, X3.4-1963[1] in perforated tape. It is one of a series of standards relating to information interchange among information processing systems, communication systems and associated equipment.

Other standards will specify the physical, chemical and optical characteristics of the tape. Related standards will deal with machine tool and process control.

The arrangement of the 7 bits in hole tracks was developed by a group of highly qualified and experienced specialists in the use of perforated tape in information processing and communication.

Historical work in the field was considered in the development of this standard.

This standard was approved as American Standard by the American Standards Association on July 9, 1965.[2]

Suggestions for improvement gained in the use of this standard will be welcome. They should be sent to the USA Standards Institute.

The ASA Sectional Committee on Computers and Information Processing, X3, which developed this standard, had the following personnel at the time of approval:

C. A. Phillips, *Chairman* V. E. Henriques, *Secretary*

Organization Represented	*Name of Representative*
ASA Sectional Committee on Office Machines, X4	C. E. Ginder
Administrative Management Society	F. Gardner
Air Transport Association of America	F. C. White
American Bankers Association	G. W. Frey
American Gas Association and Edison Electric Institute *(Jointly)*	J. A. Comerford
American Petroleum Institute	F. A. Gitzendanner
Association of American Railroads	C. Byham
Association for Computing Machinery	S. Gorn
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Electronic Industries Association	H. L. Tholstrup
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National Bureau of Standards	S. N. Alexander
National Machine Tool Builders Association	M. Sluis
National Retail Merchants Association	E. Langtry
Systems and Procedures Association	E. Tomeski
Telephone Group	L. W. Claussen
U. S. Department of Defense	G. L. Bowlby

[1] A revised USA Standard Code for Information Interchange was approved in 1967.

[2] The American Standards Association was reconstituted as the United States of America Standards Institute in August 1966, and American Standards are now designated USA Standards.

The personnel of the X3.2 Subcommittee on Character Sets and Data Format, which developed and processed this standard, was as follows:

L. L. Griffin, *Chairman*
O. R. Arne
J. F. Auwaerter
E. A. Avakian
T. R. Bousquet
R. M. Brown
E. H. Clamons
M. R. Dilling
R. M. Gryb
A. H. Hassan
R. M. Ireland
W. Y. Lang
E. J. Lewis
J. L. Little
C. E. Mackenzie
C. E. Macon
M. Mendelsohn
G. L. Murphy
J. K. Nelson
H. Spielman
J. E. Taunt
H. Tholstrup
R. E. Utman
E. F. Vidro
A. Whitman
J. Windhorst

The Task Group X3.2.2 on Perforated Tape, which developed the proposal, had the following personnel:

J. F. Auwaerter, *Chairman*
M. R. Dilling
H. Epstein
W. Flieg
R. H. Hunter
R. M. Ireland
W. J. Kosinski
J. R. Lakin
W. Y. Lang
B. V. Magee
W. J. Osterman
C. E. Schultheiss
F. W. Smith
F. G. Von Kummer

USA Standard Perforated Tape Code for Information Interchange

1. Scope

This standard specifies the representation of the USA Standard Code for Information Interchange, X3.4-1963,[1] in perforated tape and similarly encoded media, used for interchange of information among equipments such as office machines, and information processing and communications apparatus.

2. Arrangement

The perforations shall be arranged in eight longitudinal tracks, one for each of the seven information levels and one for parity. The bits of the USA Standard Code shall be assigned to hole tracks as shown in Fig. 1. The character represented by each 8 bit pattern is the character given in the corresponding column and row of the USA Standard Code for Information Interchange, X3.4-1963.[1]

3. Parity

A parity bit for each character (vertical parity) shall be part of the perforated tape code. The parity bit shall be recorded in the number 8 track and shall be chosen to provide an even number of code holes for each character.

[1] A revised USA Standard Code for Information Interchange was approved in 1967.

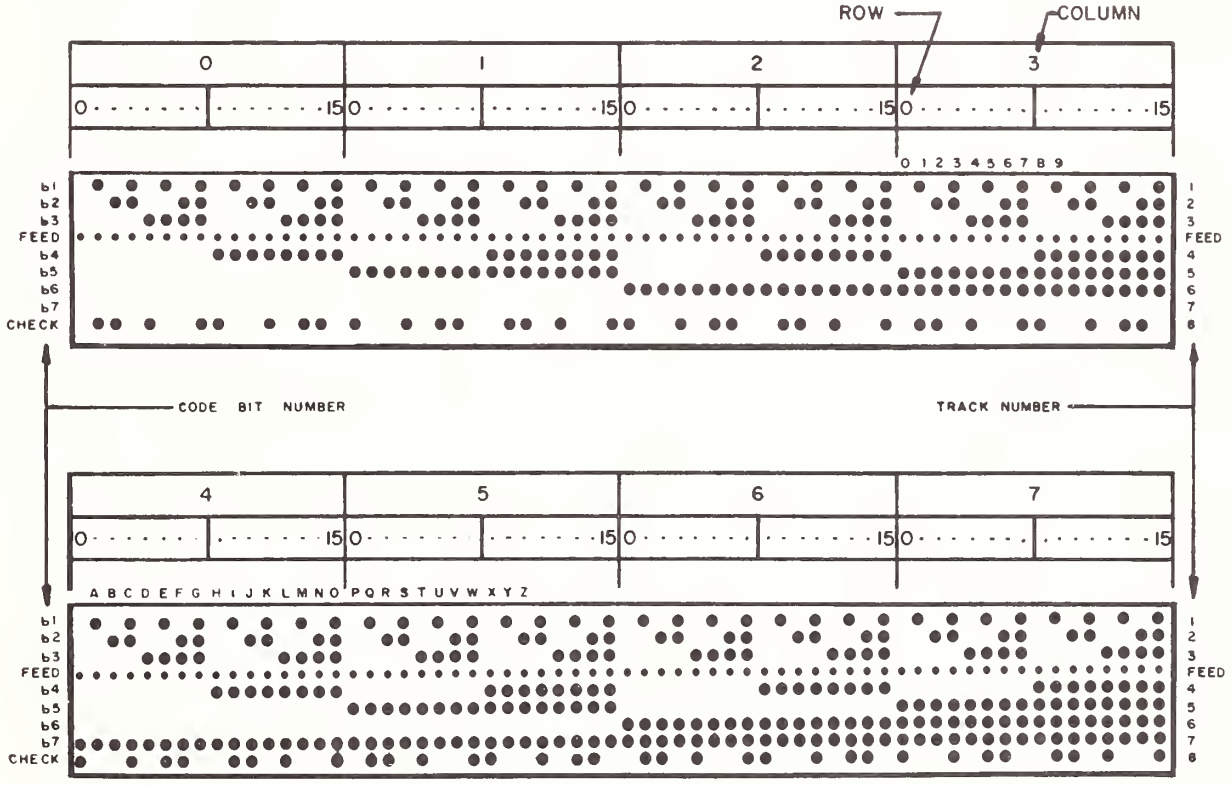

Fig. 1
Perforated Tape Code

NOTE: For character assignments by column and row see USA Standard Code for Information Interchange, X3.4-1963 (see Section 5). The numerical and capital alaphabetical characters of the Code are illustrated above for ease of reference.

4. Qualifications

4.1 Deviations from the standard may create serious difficulties in information interchange and should be used only with full cognizance of the parties involved.

4.2 The Appendixes to this standard cover the scope and use of the perforated tape code and specific criteria.

5. Revision of USA Standard Referred to in This Document

When the following USA Standard referred to in this document is superseded by a revision approved by the United States of America Standards Institute, the revision shall apply:

USA Standard Code for Information Interchange, X3.4-1963[1]

[1] A revised USA Standard Code for Information Interchange was approved in 1967.

Appendixes

(These Appendixes are not a part of USA Standard Perforated Tape Code for Information Interchange, X3.6-1965, but are included to facilitate its use.)

Appendix A
Scope and Use of the Perforated Tape Code

A1.1 The Standard Perforated Tape Code is intended for interchange of information among office machines, information processing and communication systems, and associated equipment.

A1.2 This standard does not specify the physical characteristics of the medium in which the code is perforated. Its scope is limited to media such as tape and edge-punched documents perforated by a pattern of holes lying on the intersection of longitudinal and perpendicular transverse center lines spaced approximately one-tenth of an inch apart. It is normally expected that these media include a sprocket or feed hole track.

A1.3 Work will continue in the following areas (not necessarily listed in order of priority): (1) physical characteristics of the media, (2) tape handling conventions (interchangeable reels, marking and direction of wind, leaders and trailers, etc). (3) marking of tapes (e.g., edge notching) for local control or other purposes.

Appendix B
Specific Criteria

B1. Introduction

B1.1 The criteria on which the design of the code was based have not all been entirely satisfied. Some are conflicting, and the choice of code represents an acceptable compromise of those divergent criteria.

B2. Criteria

B2.1 The criteria on which the code is based are summarized below, not necessarily in order of importance:

(1) The information bits should be grouped in 7 contiguous tracks to simplify operator interpretation of unprinted tapes.
(2) The information bits should be arranged in (ascending or descending) numerical order across the tape to simplify operator interpretation of unprinted tapes.
(3) A single (vertical) parity bit per character offers good protection against characteristic machine errors, and the standard should provide for such redundancy.
(4) The parity bit should be so placed as to be immutable in contraction or expansion to other code levels.
(5) The track number of the tape and the bit number of the logical code should be the same in order to minimize maintenance man and operator confusion.
(6) Any 4-bit subset (consisting of the 4 low order code bits) should be recordable in the low number tracks of the tape. It is desirable that this be done in a manner which can be consistent between 11/16-inch and 1-inch tape.

USA Standards

on

Computers and Information Processing

X3.1-1962	Signaling Speeds for Data Transmission
X3.2-1963	Print Specifications for Magnetic Ink Character Recognition
X3.3-1963	Bank Check Specifications for Magnetic Ink Character Recognition
X3.4-1968	Code for Information Interchange
X3.5-1968	Flowchart Symbols and Their Usage in Information Processing
X3.6-1965	Perforated Tape Code for Information Interchange
X3.9-1966	FORTRAN
X3.10-1966	Basic FORTRAN
X3.11-1966	Specifications for General Purpose Paper Cards for Information Processing
X3.12-1966	Vocabulary for Information Processing
X3.13-1966	Parallel Signaling Speeds for Data Transmission
X3.14-1969	Recorded Magnetic Tape for Information Interchange (200 CPI, NRZI)
X3.15-1966	Bit Sequencing of the USA Standard Code for Information Interchange in Serial-by-Bit Data Transmission
X3.16-1966	Character Structure and Character Parity Sense for Serial-by-Bit Data Communication in the USA Standard Code for Information Interchange
X3.17-1966	Character Set for Optical Character Recognition
X3.18-1967	One-Inch Perforated Paper Tape for Information Interchange
X3.19-1967	Eleven-Sixteenths Inch Perforated Paper Tape
X3.20-1967	Take-Up Reels For One-Inch Perforated Tape For Information Interchange
X3.21-1967	Rectangular Holes in Twelve-Row Punched Cards
X3.22-1967	Recorded Magnetic Tape for Information Interchange (800 CPI, NRZI)
X3.24-1968	Signal Quality at Interface Between Data Processing Terminal Equipment and Synchronous Data Communication Equipment for Serial Data Transmission
X3.25-1968	Character Structure and Character Parity Sense for Parallel-by-Bit Data Communication
X3.26-1969	Hollerith Punched Card Code

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